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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:

Elena Costa et al.

Group Art Unit: 2617

Serial No: 10/532,346

Examiner: Jaime M. Holliday

Confirmation No.: 3925

Filed: April 22, 2005

For: METHOD FOR RADIO SYSTEM RESOURCE MANAGEMENT

APPEAL BRIEF UNDER 37 C.F.R. § 41.37

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Commissioner for Patents

PO Box 1450

Alexandria, VA 22313-1450

Sir:

In a Notice of Appeal filed March 31, 2008, Appellants appealed the Examiner's Office Action of October 31, 2007 finally rejecting claims 15-27. Submitted herewith are an Appeal Brief, and the requisite fees set forth in 37 C.F.R. § 41.20(b). The due date was May 31 which being a Saturday renders this appeal brief timely filed Monday, June 2, 2008.

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I. REAL PARTY IN INTEREST

The real party in interest is SIEMENS AKTIENGESELLSCHAFT, Munich, the assignee of this application (per assignment submitted on April 22, 2005).

II. RELATED APPEALS AND INTERFERENCES

Appellant, appellant's legal representative, and the assignee do not know of any prior or pending appeals, interferences or judicial proceedings which may be related to, directly affect or be directly affected by, or have a bearing on, the Board's decision in this appeal.

III. STATUS OF THE CLAIMS

Claims 15, 16, 18-20 and 26-28 are rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over U.S. Patent No. 6,052,593 to Guimont et al. (hereinafter "Guimont") in view of U.S. Publication No. 2004/001429 A1 to Ma et al. ("Ma").

Claim 17 is rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Guimont in view of Ma, and in further view of U.S. Patent No. 6,917,580 B2 to Wang et al. ("Wang"). Claims 21 and 22 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Guimont in view of Ma and in further view of U.S. Publication No. 2002/0147017 to Li et al. ("Li"). Claim 23 is rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over the combination of Guimont and Ma in view of Li, and in further view of U.S. Patent No. 5,726,978 to Frodigh et al. ("Frodigh"). Claims 24 and 25 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over the combination of Guimont and Ma, in view of Li and Frodigh, and further in view of U.S. Publication No. 2002/0082016 A1 to Obayashi. ("Obayashi").

IV. STATUS OF THE AMENDMENTS

After the final Office Action, Appellants made no further amendments to the claims. On January 31, 2008, Appellants filed a Response and Request for Reconsideration. An Advisory Action was issued on February 20, 2008.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

a. Claim 15

Independent claim 15 is directed to a method for managing radio resources of a frequency band having sub-carriers in a cellular radio communications system configured as a multi-carrier system (see FIGS. 1 and 2, described on pages 7 and 8 paragraphs [0028] to [0031]). The method of claim 15 includes temporarily during a first time period allocating the sub-carriers to the radio cells, to make the sub-carriers available during a first time period to each radio cell for transmission of information (see FIGS. 3 and 4, paragraph [0013]).

The method of claim 15 further includes allocating the sub-carriers to the radio cells during a second time period, the sub-carriers being allocated by assigning each of the sub-carriers only to a subset of the radio cells including at least two radio cells for transmission of the information (see paragraphs [0014] and [0016]).

b. Claim 27

Independent claim 27 is directed to a radio communication system of cellular construction configured as a multi-carrier system using at least one frequency band having sub-carriers for transmission of information (see FIG. 1 described in paragraph [0028] on page 7). The radio communication system includes at least two radio cells (BS₁, BS₂, BS₃ in FIG. 1) and at least one control device assigning the sub-carriers of the at least one frequency band to said at least two radio cells (SE in FIG. 1, paragraph [0029]). The control device makes all of the sub-carriers temporarily available to each radio cell for transmission of information, during a first time period, and temporarily makes each of the sub-carriers available to a subset of the at least two radio cells for transmission of information, during a second time period (see paragraphs [0030], [0033]-[0035] and [0037]).

c. Claim 28

Independent claim 28 is directed to a control device (SE in FIG. 1) of a radio communication system of cellular construction, that is configured as a multi-carrier system having at least two radio cells with at least one frequency band having sub-carriers for transmission of information in the at least two radio cells (see FIG. 1 and paragraph [0029]). The control device SE has means for temporarily assigning the sub-carriers of the at least one

frequency band to the at least two radio cells during a first time period so that the sub-carriers are temporarily available to each radio cell for the transmission of the information, and means for temporarily assigning the sub-carriers of the at least one frequency band among the at least two radio cells during a second time period so that each of the sub-carriers is temporarily available to a subset of the at least two radio cells for the transmission of the information (see paragraphs [0030], [0033]-[0035] and [0037]).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Appellants request review of rejection of claims 15, 16, 18-20 and 26-28 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,052,593 to Guimont et al. in view of U.S. Publication No. 2004/001429 A1 to Ma et al.

VII. ARGUMENT

a. Review of the Prior Art

Guimont discloses a method for assigning frequencies to transceivers in cells of a cellular telephone system supporting analog and/or digital communications channels (see col. 1, lines 10-13 of Guimont). A frequency assignment proposal is evaluated to determine whether it is compatible with a current cell configuration, by insuring that sufficient frequencies having appropriate operating modes are available for assignment to meet the traffic and control channel requirements and availability of the included cell transceivers. (See Guimont's Abstract.) Approved proposals result in a revision of the frequency plan assignment. Based on records of past approved proposals, it is determined whether a current proposal if implemented would have an adverse effect on the network.

FIG. 1 of Guimont illustrates the cells 10 being grouped in clusters of 10. Each cluster uses all the available frequencies (A to G) while any single cell of a cluster uses only a subset A of the available frequencies. (See col. 4, lines 7-40.) Although the allocation of the frequencies may be changed, the allocation can be maintained for long periods, it is not dynamically periodically changed according to a predetermined sequence of allocation schedules.

Ma discloses a wireless terminal for communicating over a shared Orthogonal Frequency Division Modulation (OFDM) band, the wireless terminal having a first transmit chain for generating and transmitting a low rate mode OFDM transmission in a first frequency band of the OFDM band, and a second transmit chain for generating and transmitting a burst-mode

transmission in a second frequency band of the OFDM band, the first frequency band being distinct from the second frequency band.

Figure 2 of Ma illustrates the usage of OFDM frequencies 1-32. Each circle represents the transmission of a single sub-carrier during a single transmission (see [0122]). Mode 1 sub-carriers are used for low rate circuit oriented connectivity, while Mode 2 sub-carriers used for higher rate bursting connectivity. At certain times, e.g. between t_{i+10} and t_{i+11} , all the carriers may be used for Mode 2.

b. Ma and Guimont do not render obvious the allocation to radio cells

The cited prior art references fail to teach or suggest “temporarily during a first time period allocating the sub-carriers to the radio cells, to make the sub-carriers available during a first time period to each radio cells for transmission of information” and “allocating the sub-carriers to the radio cells during a second time period, the sub-carriers being allocated by assigning each of the sub-carriers only to a subset of the radio cells including at least two radio cells for transmission of the information.”

There is no apparent difference of opinion between the Applicants and Examiner regarding what the prior art references teach. A combination of Guimont’s and Ma’s teachings would lead a person of ordinary skill in the art to a method having the following features:

- dividing the radio frequencies in the cellular frequency band according to a frequency band into frequency groups,
- grouping cells into clusters,
- assigning a different frequency group to each cell of a cluster,
- allocating frequency groups (sub-carriers) to different transmission modes during different time periods.

That is, even if Guimont generally discloses allocating subcarriers to radio cells, it does not anticipate or render obvious at least making the sub-carriers available during a first time period to each radio cell for transmission of information in claim 15.

Further, even if Ma discloses an allocation of sub-carriers to modes in different time-frames, it does not teach or suggest allocation **to radio cells** as recited in claim 15.

The advantages achieved by the claimed method are not possible with the method

resulting merely from combining Guimont and Ma as outlined above. The claimed method provides the information necessary for handover decisions and serves as a basis for reducing interference and enabling a higher spectrum efficiency (see paragraphs [0036]-[0039] on pages 9-10 of the specification).

c. The combination of Guimont and Ma is a hindsight reconstruction of the claimed invention

On page 5 of the outstanding Office Action it is asserted:

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to assign different sub-carriers to modes that are implemented at different periods as taught by Ma et al. in the method of Guimont et al., in order to efficiently create a frequency plan.

In *KSR Corp. v. Teleflex Inc.* (2007), the Supreme Court maintained that the analysis supporting a rejection under 35 U.S.C. 103(a) should be made explicit, and that it was "important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the [prior art] elements" in the manner claimed.¹ "Efficiently creating a frequency plan" is the objective in Guimont and it is not related to the current application.

The Advisory Action mailed February 20, 2008 asserts that the reason to combine is proper because the current patent application of the cited prior art both teach frequency allocation, and even a rationale different from the objective of the application is permissible. Appellants respectfully submit that this rebuttal falls short because it does not take into consideration the particularities of the prior art and the claimed invention. Guimont teaches that frequency allocation to cells may be revised at times based on an approved frequency plan. As submitted in the Office Action, Guimont does not teach using different allocation plans at different times. Since Guimont attains its objective by changing the frequency allocation scheme occasionally there appears to be no incentive to have two approved frequency allocation schemes applied sequentially. Ma focuses on a different aspect of transmission and does not refer to the radio cells individually. Moreover although Ma teaches that at times all the

¹ Often, it will be necessary . . . to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue. To facilitate review, this analysis should be made explicit. KSR, slip op. at 14.

frequencies may be used for one mode, it does not teach or suggest any periodicity or regular change of the frequency allocation. Moreover, after all frequencies are allocated to Mode 2, there is no apparent reason to return to the previous frequency allocation per modes.

d. Improper rejections of claims 16, 18-20 and 26-28

On page 5 lines 13-14 of the outstanding Office Action, claim 16 is rejected by stating "Li et al., as modified by Guimont et al., clearly show and disclose the claimed invention as applied to claim 15...". However, no Li et al. reference has been indicated and applied relative to claim 15. Similar language is used relative to claims 18-20 and 26.

On page 7 line 13 of the outstanding Office Action, independent claim 27 is rejected by stating "Reinhardt clearly shows..." However no Reinhart reference has been indicated. Further it appears that the support for the rejection of claim 15 is copied verbatim without making any reference to the features recited in claim 27. A similar situation occurs relative to claim 28 (see line 10 on page 9).

Therefore Applicants respectfully submit that the Office Action failed to meet the standard set forth in 37 C.F.R. 1.104 (c)(2) applicable when rejecting a claim.

VIII. CONCLUSION

Applicants submit that claims 15-28 patentably distinguish over the prior art. Reversal of the Examiner's rejections is respectfully requested.

Respectfully submitted,

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Date: _____

By: _____

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IX. THE CLAIM APPENDIX

15. (PREVIOUSLY PRESENTED) A method for managing radio resources of a frequency band having sub-carriers in a cellular radio communications system configured as a multi-carrier system, comprising:

temporarily during a first time period allocating the sub-carriers to the radio cells, to make the sub-carriers available during a first time period to each radio cells for transmission of information; and

allocating the sub-carriers to the radio cells during a second time period, the sub-carriers being allocated by assigning each of the sub-carriers only to a subset of the radio cells including at least two radio cells for transmission of the information.

16. (PREVIOUSLY PRESENTED) A method in accordance with claim 15, wherein said allocating of the sub-carriers during the second time period makes at least one of the sub-carriers available to exactly one radio cell in the at least two radio cells.

17. (PREVIOUSLY PRESENTED) A method in accordance with claim 16, wherein said allocating of the sub-carriers during the second time period makes each of the sub-carriers available to exactly one radio cell in the at least two radio cells.

18. (PREVIOUSLY PRESENTED) A method in accordance with claim 15, wherein the at least two radio cells are adjacent radio cells.

19. (PREVIOUSLY PRESENTED) A method in accordance with claim 15, wherein said allocating of the sub-carriers during the second time period allocates the sub-carriers to n radio cells, making assigned sub-carriers available to at least one radio cell have a frequency spacing of n sub-carriers.

20. (PREVIOUSLY PRESENTED) A method in accordance with claim 15, wherein said allocating of the sub-carriers during the second time period makes at least some adjacent sub-carriers in the frequency band available to at least one radio cell.

21. (PREVIOUSLY PRESENTED) A method in accordance with claim 15, wherein said allocating of the sub-carriers during the second time period takes place in accordance with an algorithm that includes use of a code.

22. (PREVIOUSLY PRESENTED) A method in accordance with claim 21, wherein said allocating of the sub-carriers during the second time period makes the sub-carriers used by base stations of particular radio cells available for transmission of broadcast information.

23. (PREVIOUSLY PRESENTED) A method in accordance with claim 22, wherein the broadcast information is used to decide on handovers.

24. (PREVIOUSLY PRESENTED) A method in accordance with claim 23, further comprising determining amplitudes of the broadcast information in subscriber stations receiving the broadcast information.

25. (PREVIOUSLY PRESENTED) A method in accordance with claim 24, further comprising determining a metric of the amplitudes of the broadcast information transmitted from one of the base stations on the sub-carriers available to the one of the base stations.

26. (PREVIOUSLY PRESENTED) A method in accordance with claim 15, wherein the cellular radio communications system is an orthogonal frequency division multiplexing system.

27. (PREVIOUSLY PRESENTED) A radio communication system of cellular construction configured as a multi-carrier system using at least one frequency band having sub-carriers for transmission of information, comprising:

at least two radio cells; and

at least one control device assigning the sub-carriers of the at least one frequency band to said at least two radio cells during a first time period to make all of the sub-carriers temporarily available to each radio cell for transmission of information, and that during a second time period temporarily each of the sub-carriers is available to a subset of the at least two radio cells for transmission of information.

28. (PREVIOUSLY PRESENTED) A control device of a radio communication system of cellular construction, that is configured as a multi-carrier system having at least two radio cells with at least one frequency band having sub-carriers for transmission of information in the at least two radio cells, comprising:

means for temporarily assigning the sub-carriers of the at least one frequency band to the at least two radio cells during a first time period so that the sub-carriers are temporarily available to each radio cell for the transmission of the information; and

means for temporarily assigning the sub-carriers of the at least one frequency band among the at least two radio cells during a second time period so that each of the sub-carriers is temporarily available to a subset of the at least two radio cells for the transmission of the information.

X. EVIDENCE APPENDIX

Not applicable.

XI. RELATED PROCEEDING APPENDIX

Not applicable.

REMARKS

In accordance with the foregoing, claims 15-28 are pending and under consideration. The Office Action Summary does not reflect the status of the claims correctly and completely. Claims 1-14 are cancelled, not withdrawn as indicated therein. Therefore, only claims 15-28 are pending and under consideration. The Office Action Summary gives no indication regarding whether claim 28 is allowed or rejected (although based on the content of the Office Action, Applicants believe that claim 28 is rejected). Appropriate corrections are respectfully requested.

REJECTIONS UNDER 35 U.S.C. §103

Claims 15, 16, 18-20 and 26-28 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,052,593 to Guimont et al. (hereinafter "Guimont") in view of U.S. Publication No. 2004/001429 A1 to Ma et al. ("Ma").

In the Amendment filed on August 9, 2007, applicants argued that independent claim 15 is not rendered obvious by Guimont and Ma. In the "Response to Arguments" section on page 2 of the outstanding Office Action, the Examiner responds to Applicants' arguments by stating that:

Guimont et al. teaches allocating sub-carriers of the frequency band to radio cells for frequency reuse scheme. However, the allocation does not occur during different time periods. The allocation of sub-carriers to modes (modes relate to different time-frames) is used to overcome that limitation (allocating sub-carriers during a first time period and a second time period).

See lines 9-13 of the outstanding Office Action.

Applicants respectfully submit that in combining features disclosed in different references, the Examiner fails to consider the context of the teachings and whether the combination does in fact disclose the claimed features. See in MPEP 2141.02 "In determining the differences between the prior art and the claims, the question under 35 U.S.C. 103 is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious." *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 218 USPQ 871 (Fed. Cir. 1983); *Schenck v. Nortron Corp.*, 713 F.2d 782, 218 USPQ 698 (Fed. Cir. 1983).

There is no apparent difference of opinion between the Applicants and Examiner regarding what the prior art references teach. However, the rejections put forth in the

outstanding Office Action fail to meet the requirements of 37 C.F.R. 104(c)(2)² because they fail to show how and which one of the teachings of the prior art is asserted to render obvious the claim recitations. The logical connection between the prior art teachings and the claim recitations is missing in the alleged support for the rejections. That is, the Office Action merely repeats the disclosure of the prior art references, but does not link them to the features recited in the claims, therefore, precluding Applicants from rebutting the rejections efficiently. Applicants cannot deny that the prior art references teach what they teach, but respectfully submit that the prior art's teachings do not render obvious the claim recitations.

Thus, a combination of Guimont's and Ma's teachings would lead a person of ordinary skill in the art to a method having the following features:

- dividing the radio frequencies in the cellular frequency band according to a frequency band into frequency groups,
- grouping cells into clusters,
- assigning to each cell of a cluster a different frequency group,
- allocating frequency groups (sub-carriers) to different transmission modes during different time periods.

However this combination fails to teach

- temporarily during a first time period allocating the sub-carriers to the radio cells, **to make the sub-carriers available during a first time period to each radio cells for transmission of information;** and
- allocating the sub-carriers to the radio cells during a second time period, **the sub-carriers being allocated by assigning each of the sub-carriers only to a subset of the radio cells including at least two radio cells for transmission of the information,** (emphasis ours)

as recited in claim 15. That is, even if Guimont discloses allocating subcarriers to radio cells, it does not teach the two different manners of allocating sub-carriers to radio cells as recited in claim 15 (emphasized above). Similarly, even if Ma discloses an allocation of sub-carriers to

² "When a reference is complex or shows or describes inventions other than that claimed by the applicant, the particular part relied on must be designated as nearly as practicable. The pertinence of each reference, if not apparent, must be clearly explained and each rejected claim specified." 37 C.F.R. 104(c)(2).

modes in different time-frames, it does not teach or suggest allocation to **radio cells** as recited in claim 15. The invention as recited in claim 15 is not rendered obvious by combining the teachings of Guimont and Ma.

Additionally, on page 5 of the outstanding Office Action it is asserted:

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to assign different sub-carriers to modes that are implemented at different periods as taught by Ma et al. in the method of Guimont et al., in order to efficiently create a frequency plan.

In *KSR Corp. v. Teleflex Inc.* (2007), the Supreme Court maintained that the analysis supporting a rejection under 35 U.S.C. 103(a) should be made explicit, and that it was "important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the [prior art] elements" in the manner claimed.³ "Efficiently creating a frequency plan" is the objective in Guimont and it is not related to the current application. Applicants respectfully submit that the outstanding Office Action fails to provide a viable reason for combining the references as required.

In view of the above-presented arguments, claim 15 and claims 16-26 depending directly or indirectly from claim 15 are patentable over the combination of Guimont with Ma.

Independent claim 27 patentably distinguishes over Guimont and Ma at least by reciting "at least one control device assigning the sub-carriers of the at least one frequency band to said at least two radio cells during a first time period to make all of the sub-carriers temporarily available to each radio cell for transmission of information, and that during a second time period temporarily each of the sub-carriers is available to a subset of the at least two radio cells for transmission of information."

Independent claim 28 patentably distinguishes over Guimont and Ma at least by reciting:

- means for temporarily assigning the sub-carriers of the at least one frequency band to the at least two radio cells during a first time period so that the sub-

³ Often, it will be necessary . . . to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue. To facilitate review, this analysis should be made explicit. KSR, slip op. at 14.

carriers are temporarily available to each radio cell for the transmission of the information, and

means for temporarily assigning the sub-carriers of the at least one frequency band among the at least two radio cells during a second time period so that each of the sub-carriers is temporarily available to a subset of the at least two radio cells for the transmission of the information.

Claim 17 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Guimont in view of Ma, and in further view of U.S. Patent No. 6,917,580 B2 to Wang et al. ("Wang"). Claims 21 and 22 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Guimont in view of Ma and in further view of U.S. Publication No. 2002/0147017 to Li et al. ("Li"). Claim 23 was rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Guimont and Ma in view of Li, and in further view of U.S. Patent No. 5,726,978 to Frodigh et al. ("Frodigh"). Claims 24 and 25 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Guimont and Ma, in view of Li and Frodigh, and further in view of U.S. Publication No. 2002/0082016 A1 to Obayashi. ("Obayashi").

Wang, Li, Frodigh and Obayashi do not correct or compensate for the above identified failure of Guimont and Ma in rendering obvious the independent claims. Therefore, all the claims depending from claim 15 (i.e. 16-26) patentably distinguish over the cited prior art at least by inheriting patentable features from the independent claim.

CONCLUSION

There being no further outstanding objections or rejections, the application is submitted as being in condition for allowance which action is earnestly solicited. At a minimum, this Amendment should be entered at least for purposes of Appeal as it either clarifies and/or narrows the issues for consideration by the Board.

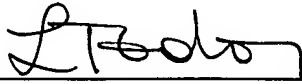
If the Examiner has any remaining issues to be addressed, it is believed that prosecution can be expedited and possibly concluded by the Examiner contacting the undersigned attorney for a telephone interview to discuss any such remaining issues.

If there are any underpayments or overpayments of fees associated with the filing of this Amendment, please charge and/or credit the same to our Deposit Account No. 19-3935.

Respectfully submitted,

STAAS & HALSEY LLP

Date: June 2, 2008

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